Audit Report

FUNDING AND LOGISTICS FOR THE
JOINT HELMET MOUNTED CUEING SYSTEM

Report No. D-2001-132 May 31, 2001

Office of the Inspector General
Department of Defense

Form SF298 Citation Data

Report Date *("DD MON YYYY")* 31 06 2001	**Report Type** N/A	**Dates Covered (from... to)** *("DD MON YYYY")*

Title and Subtitle Funding and Logistics for the Joint Helmet Mounted Cueing System	**Contract or Grant Number**
	Program Element Number
Authors	**Project Number**
	Task Number
	Work Unit Number
Performing Organization Name(s) and Address(es) OAIG-AUD (ATTN: AFTS Audit Suggestions) Inspector General, Department of Defense 400 Army Navy Drive (Room 801) Arlington, VA 22202-2884	**Performing Organization Number(s)** D-2001-132
Sponsoring/Monitoring Agency Name(s) and Address(es)	**Monitoring Agency Acronym**
	Monitoring Agency Report Number(s)
Distribution/Availability Statement Approved for public release, distribution unlimited	
Supplementary Notes	

Abstract
This report is the second of two audit reports addressing the Joint Helmet Mounted Cueing System. The system consists of a helmet-mounted display unit and aircraft interface components that will enhance aircraft fighter pilots ability to engage and destroy airborne targets. The Joint Helmet Mounted Cueing System is one element of a larger system-of-systems high-off-boresight capability that will provide a first look, first shot advantage to the U.S. warfighter. The capability allows the pilots to engage, lock, and launch weapons at a target wherever the pilot is looking, beyond the radars field of view, but within the constraints of the missile limits. The capability works with the Navy and Air Force AIM-9X missile. The AIM-9X missile is currently in development with an estimated completion date of May 2003. If the missile is not deployed at the same time as the helmet, there will still be added capability because the helmet visor displays data such as airspeed, altitude, target range, weapons, sensors, and navigation. The Air Force plans to employ the Joint Helmet Mounted Cueing System as upgrades on the F-15 C/D and F-16 C/D blocks 40 and 50 aircraft, and insert the helmet into the production line for the F-22. The Navy plans to incorporate the helmet in the F/A-18 E/F production line and as a planned upgrade to the F/A-18 C/D model. The Joint Helmet Mounted Cueing System is a joint Air Force and Navy acquisition category III program under the milestone decision authority of the Air Force Program Executive Officer for Fighters and Bombers. The helmet is in the engineering, manufacturing, and development phase of the acquisition cycle and is scheduled for a Milestone III full-rate production decision in April 2002. As of December 31, 2000, the estimated total research, development, test, and evaluation and production costs were approximately $672 million.

Subject Terms

Document Classification unclassified	**Classification of SF298** unclassified
Classification of Abstract unclassified	**Limitation of Abstract** unlimited
Number of Pages 27	

Additional Copies

To obtain additional copies of this audit report, visit the Inspector General, DoD, Home Page at www.dodig.osd.mil/audit/reports or contact the Secondary Reports Distribution Unit of the Audit Followup and Technical Support Directorate at (703) 604-8937 (DSN 664-8937) or fax (703) 604-8932.

Suggestions for Future Audits

To suggest ideas for or to request future audits, contact the Audit Followup and Technical Support Directorate at (703) 604-8940 (DSN 664-8940) or fax (703) 604-8932. Ideas and requests can also be mailed to:

OAIG-AUD (ATTN: AFTS Audit Suggestions)
Inspector General, Department of Defense
400 Army Navy Drive (Room 801)
Arlington, VA 22202-4704

Defense Hotline

To report fraud, waste, or abuse, contact the Defense Hotline by calling (800) 424-9098; by sending an electronic message to Hotline@dodig.osd.mil; or by writing to the Defense Hotline, The Pentagon, Washington, DC 20301-1900. The identity of each writer and caller is fully protected.

Acronyms

BES	Budget Estimate Submission
JHMCS	Joint Helmet Mounted Cueing System
POM	Program Objective Memorandum

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-4704

May 31, 2001

MEMORANDUM FOR ASSISTANT SECRETARY OF THE AIR FORCE
(FINANCIAL MANAGEMENT AND COMPTROLLER)

SUBJECT: Audit Report on Funding and Logistics for the Joint Helmet Mounted Cueing System (Report No. D-2001-132)

We are providing this report for review and comment. We considered management comments on a draft of this report when preparing the final report

DoD Directive 7650.3 requires that all recommendations be resolved promptly. The Air Force comments were partially responsive, but did not address all parts of the recommendations. Therefore, we request additional comments from the Air Force Program Executive Officer on Recommendations A and B by July 2, 2001.

We appreciate the courtesies extended to the audit staff. For additional information on this report, please contact Mr. Raymond A. Spencer at (703) 604-9071 (DSN 664-9071) (rspencer@dodig.osd.mil) or Mr. Thomas S. Bartoszek at (703) 604-9014 (DSN 664-9014) (tbartoszek@dodig.osd.mil). See Appendix B for the report distribution. The audit team members are listed inside the back cover.

David K. Steensma

David K. Steensma
Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. D-2001-132 **May 31, 2001**
(Project No. D2000AB-0220.001)

Funding and Logistics for the Joint Helmet Mounted Cueing System

Executive Summary

Introduction. This report is the second of two audit reports addressing the Joint Helmet Mounted Cueing System. The system consists of a helmet-mounted display unit and aircraft interface components that will enhance aircraft fighter pilots ability to engage and destroy airborne targets. The Joint Helmet Mounted Cueing System is one element of a larger system-of-systems high-off-boresight capability that will provide a first look, first shot advantage to the U.S. warfighter. The capability allows the pilots to engage, lock, and launch weapons at a target wherever the pilot is looking, beyond the radar's field of view, but within the constraints of the missile limits. The capability works with the Navy and Air Force AIM-9X missile. The AIM-9X missile is currently in development with an estimated completion date of May 2003. If the missile is not deployed at the same time as the helmet, there will still be added capability because the helmet visor displays data such as airspeed, altitude, target range, weapons, sensors, and navigation. The Air Force plans to employ the Joint Helmet Mounted Cueing System as upgrades on the F-15 C/D and F-16 C/D blocks 40 and 50 aircraft, and insert the helmet into the production line for the F-22. The Navy plans to incorporate the helmet in the F/A-18 E/F production line and as a planned upgrade to the F/A-18 C/D model. The Joint Helmet Mounted Cueing System is a joint Air Force and Navy acquisition category III program under the milestone decision authority of the Air Force Program Executive Officer for Fighters and Bombers. The helmet is in the engineering, manufacturing, and development phase of the acquisition cycle and is scheduled for a Milestone III full-rate production decision in April 2002. As of December 31, 2000, the estimated total research, development, test, and evaluation and production costs were approximately $672 million.

Objectives. The audit objective was to evaluate the overall management of the Joint Helmet Mounted Cueing System. This report addresses core depot activation and budgeting for Joint Helmet Mounted Cueing System requirement. The first report addressed testing, contracting, and the management control program as it related to the overall objectives.

Results. The activation of a depot maintenance capability to support core capability requirements for the Joint Helmet Mounted Cueing System is delayed and at risk. As a result, the Joint Helmet Mounted Cueing System may not efficiently transition from an interim contractor support capability to an organic depot maintenance capability. Additionally, costs for depot activation may unnecessarily increase (finding A). Also the Air Force F-15, F-16, and F-22 system program offices were not provided reliable

cost information to budget for Joint Helmet Mounted Cueing System requirements. As a result, there is a $29.7 million shortfall to acquire 205 Joint Helmet Mounted Cueing System units within the FY 2002 to FY 2007 Budget Estimate Submission (finding B).

Summary of Recommendations. We recommend that the Program Manager, Joint Helmet Mounted Cueing System Program, request funding from the Air Combat Command and the Chief of Naval Operations to activate the Joint Helmet Mounted Cueing System organic depot, obtain technical data from the contractor and an estimate of interim contractor logistics support, and provide the costs and the methodology to budget costs to the platform system program offices. In addition, we recommend that the Joint Program Office obtain and provide the F-15, F-16, and F-22 system program offices current unit cost information to budget for the requirements of the Program Objective Memorandum.

Management Comments. The Air Force Program Executive Officer for Fighter and Bomber Programs did not agree with the findings as presented. He concurred with the recommendations and stated that the program manager for the Joint Helmet Mounted Cueing System has provided the budget request to the Services for depot activation for the FY 2004 Program Objective Memorandum and provided the impacts, if activation was not funded. He stated that Depot activation would occur in FY 2007. He also indicated that the program office was updating the Cost as An Independent Variable Model from a design tool to a budget tool. The program office plans to use the actual low-rate initial production cost data in the model for cost projections. The Finding section of the report contains a discussion of management comments. The complete text of management comments is in the Management Comments section.

Audit Response. The Air Force comments were partially responsive. However, we request comments by July 2, 2001, on the parts of the recommendations about obtaining technical data for organic depot logistics support, obtaining an estimate of interim contractor logistics support from the contractor and providing the updated cost information to the system program offices to budget for requirements.

Table of Contents

Background

This report is the second of two audit reports addressing the Joint Helmet Mounted Cueing System (JHMCS). The system consists of a helmet-mounted display unit and aircraft interface components that will enhance aircraft fighter pilots ability to engage and destroy airborne targets. The JHMCS is one element of a larger system-of-systems high-off-boresight capability that will provide a first look, first shot advantage to the U.S. warfighter. The capability allows the pilots to engage, lock, and launch weapons at a target wherever the pilot is looking beyond the radar's field of view, but within the constraints of the missile limits. The capability works with the Navy and Air Force AIM-9X missile currently in development. The JHMCS also displays data in the visor such as airspeed, altitude, target range, and information on weapons, sensors, and navigation. The feature saves time when engaged in combat because the pilot can view vital information in the visor instead of on the cockpit display panel. The Air Force plans to employ the JHMCS as upgrades on the F-15 C/D and F-16 C/D blocks 40 and 50 aircraft, and insert the JHMCS into the production line for the F-22. The Navy plans to incorporate the JHMCS in the F/A-18 E/F production line and as a planned upgrade to the F/A-18 C/D model. The two aircraft that will first receive the JHMCS are the Navy F/A-18 E/F and the Air Force F-15 C/D models. The Boeing Company is the prime contractor for the F/A-18, the F-15, and the JHMCS and will integrate the helmet into those aircraft. Lockheed Martin is the manufacturer for the F-16 and F-22 aircraft and will integrate the helmet into those aircraft.

The JHMCS is a joint Air Force and Navy acquisition category III program under the milestone decision authority of the Air Force Program Executive Officer for Fighters and Bombers. It is in the engineering, manufacturing, and development phase of the acquisition cycle, which began in January 1997, with planned completion in March 2002. The development contract was a cost-plus-award-fee instrument for approximately $60 million. The development program was estimated to be about $75 million. The Program Executive Officer scheduled the Milestone III, full-rate production decision for September 2000, with operational testing to begin in September 1999 for the F/A-18 and July 1999 for the F-15. However, in December 1999, several technical challenges remained during development, including system maturity, reliability, and maintenance. The Program Executive Officer restructured the program and rescheduled the production decision for April 2002, with operational testing to begin in June 2001. The restructure extended the engineering, manufacturing, and development phase until March 2002, permitting time to solve the problems. Also, the JHMCS Joint Program Office added a second low-rate initial production for the F-15, F-16, and F/A-18 E/F to start in March 2001. The first low-rate initial production for the F/A-18 was approved in May 2000, with the contract awarded in August 2000. Restructure costs totaled approximately $22 million. As of December 31, 2000, the Joint Program Office for the JHMCS estimated the total research, development, test, and evaluation and production costs for the helmet to be $672 million, which included 1,882 helmets and associated aircraft modification kits.

Core depot maintenance is the capability maintained within Defense depots to meet readiness and sustainability requirements of the weapon systems that support the Joint Chiefs of Staff contingency scenarios. The maintenance is performed by a Military Department using Government-owned or-controlled facilities, tools, test equipment, spares and repair parts, and military or civilian personnel. Core capability exists to minimize the operational risks and to guarantee required readiness for weapon systems. Core depot maintenance capabilities comprise only the minimum facilities, equipment, and skilled personnel necessary to ensure a ready and controlled source of required technical competence. The determination of core capability requirements and the depot maintenance workloads necessary to sustain these capabilities are developed by the Secretary of Defense in conjunction with the Joint Chiefs of Staff using a jointly agreed upon methodology, which then becomes the DoD core requirement.

Objectives

The audit objective was to evaluate the overall management of the JHMCS. The audit was conducted in accordance with the Inspector General, DoD, critical program management element approach. See Appendix A for a discussion of the audit scope and methodology and prior audit coverage. This report addresses core depot activation and budgeting for JHMCS requirement. The first report addressed testing, contracting, and the management control program.

A. Depot Activation of Core Capability

The activation of a depot maintenance capability to support core capability requirements for the JHMCS is delayed and at risk. This condition occurred because the Joint Program Office did not secure funding and technical data for depot capability necessary to support core capability requirements, and did not obtain and provide cost estimates to the platform system program offices to budget for interim contractor support. As a result, the JHMCS may not efficiently transition from an interim contractor support capability to an organic depot maintenance capability. Additionally, costs for depot activation may unnecessarily increase.

Depot Maintenance Core Capability

Statute. Section 2464, title 10, United States Code requires that DoD maintain depot maintenance core capability to ensure a source of technical competence and resources needed to effectively and timely respond to mobilization and national defense contingency situations. The Secretary of Defense identifies the core capabilities that must be supported by a Government depot. For systems that are mission essential and necessary to fulfill strategic and contingency plans, the Services must establish a depot for repair and maintenance within 4 years after the system's initial operational capability is established.

DoD Regulation. DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information System Acquisition Programs," dated October 23, 2000, requires that program managers conduct logistics management activities throughout a system's development to ensure that the user has the support infrastructure necessary to achieve readiness requirements. Logistics management activities includes supportability analyses, which define how to cost-effectively support the system over its life cycle.

Air Force Regulation. Air Force Material Command Financial Management Handbook dated January 2000 identifies the procedures that the Air Force uses to obtain, allocate, and spend money. In addition, it states that during even-numbered calendar years, the Air Force must define their funding requirements for a 6-year period through the Program Objective Memorandums (POM), the Budget Estimate Submissions (BES), and the President's Budget. The Air Force uses the POM to request funding for their acquisition programs, the BES to provide detailed descriptions and accurate pricing of approved programs, and the President's Budget to obtain funding for their programs. The budget process begins with the submission of the POM to the Office of the Secretary of Defense in May of even-numbered calendar years and ends with the submission of the budget to Congress in February of the odd-numbered calendar years.

JHMCS Core Determination. On March 10, 1997, the Air Force Material Command performed a core analysis on the JHMCS to determine whether the JHMCS should be maintained at a commercial facility or at a Government

depot. The analysis showed that the JHMCS is on aircraft tasked for contingency operations. It recommended basing the source of repair decision on cost or other than core factors if a risk assessment concluded that the risk of contractor support is low.

In November 1998, the Joint Program Office performed a cost-benefit analysis that compared costs of depot maintenance by a Government depot to the costs by a contractor depot. The analysis concluded that depot maintenance at a Government facility would result in potential monetary benefits of more than $8 million over a 10-year period.

On June 8, 1999, the Naval Air Systems Command determined that the JHMCS must be supported at a Government facility to support core capability requirements because it was on a contingency aircraft, was a non-commercial component, and would provide a depot capability that did not exist within DoD.

On July 15, 1999, the Air Force revisited the core analysis of March 1997 and concluded that JHMCS was a core capability and that the Government should maintain and repair it at an organic depot. This is because the JHMCS is located on aircraft tasked for contingency operations and is a military component with no commercial applications. In addition, the analyses stated that the JHMCS can be used to help retain required core capability in avionics because the depot workload in avionics is underutilized.

On October 7, 1999, the Joint Program Office agreed with the Air Force Material Command to pursue 5 years of interim contractor support. Depot activation of core capability would follow within 4 years after the JHMCS initial operational capability, which was scheduled for FY 2003 and required JHMCS depot maintenance core capability activation by FY 2007.

JHMCS Depot Logistics Strategy for Core Capability

The Joint Program Office included its depot logistics strategy in the Single Acquisition Management Plan dated January 1997. The objective of the strategy was to ensure development of a viable, cost-effective, support system that reduces risks associated with the transition from production to logistics support. To meet this objective, the strategy focused on commercial depot repair. Implementation would occur using a warranty approach whereby the contractor would perform all logistics support for the life of the system, including the identification of logistics requirements such as support equipment, spare parts, technical orders, and technical manuals. In October 1999, the Joint Program Office revised its strategy to Government depot repair and, in March 2000, prepared an Integrated Logistics Support Plan, which states that the Air Force will activate the organic depot in FY 2007 and that the Joint Program Office will obtain funds to support depot activation from FY 2004 through FY 2006 in the next budget cycle.

The Joint Program Office continued pursuing the warranty approach until October 1999, when it revised its strategy to organic depot support despite the

cost-benefit analysis of November 1998, the Navy's core decision of June 1999, and the Air Force core determination in July 1999. This delayed and placed at risk activation of an organic depot capability for the JHMCS.

Organic Depot Activation

Program Funding. In October 1999, the Joint Program Office estimated that it would cost about $17.6 million to activate an organic depot that includes technical data, support equipment and investment spares. However they did not request the funding from the Air Combat Command and the Chief of Naval Operations until June 2000 for inclusion in the FY 2002 budget cycle, thereby missing the POM deadline of May 2000. The Air Combat Command and the Chief of Naval Operations are responsible for providing funding for the JHMCS depot activation. Officials from the Joint Program Office stated that they did not request the funding because other issues had to be addressed and funded, such as system maturity, reliability, and maintenance and program restructure. The Joint Program Office must now wait until the FY 2004 budget cycle to request needed funding for organic depot activation.

Officials stated that if funds are not obtained until FY 2004, it is unlikely that depot activation will occur before January 2008. This is contrary to the Joint Program Office's commitment to Air Force leadership to activate an organic depot by FY 2007. Also, if it is not funded until FY 2004 and activated by 2007, it will not meet the requirement in section 2464, title 10, United States Code to have depot maintenance core capability within 4 years of the JHMCS initial operational capability, which is scheduled for FY 2003. The program manager must now obtain funds from the Air Combat Command and the Chief of Naval Operations to activate the JHMCS organic depot.

Technical Data. The JHMCS engineering, manufacturing, and development contract, dated January 30, 1997, included a $1.4 million option for depot logistics support analysis that would expire on April 30, 1998. Air Force logistics officials stated that the depot analysis, if exercised, would have provided the Joint Program Office technical data needed to activate an organic depot and would have provided logistics requirements necessary for DoD to establish an organic capability, such as test requirement documents and support equipment data. The Joint Program Office did not exercise the option.

Boeing submitted a proposal to the Joint Program Office for the proposed program restructure costs on August 2, 2000. The proposal included organic depot logistics support analysis costs of $2.1 million. The Joint Program Office did not negotiate and contract for the support analysis because higher program requirements, such as the helmet vehicle interface redesign, required funding.

The organic depot logistics support analysis costs are unknown for the FY 2004 budget cycle when funding is expected to be available. The Joint Program Office did not obtain technical data needed to activate JHMCS organic depot maintenance capabilities. The Joint Program Office could have obtained the technical data on two separate occasions but did not. The Joint Program Office should obtain technical data for organic depot logistics support from the

contractor. Further delays in funding and in obtaining technical data will delay JHMCS organic depot activation and will increase the duration of and costs for interim contractor logistics support.

Interim Contractor Support Costs

The Joint Program Office did not request an estimate from Boeing for interim contractor logistics support costs. Officials from the Joint Program Office stated that they were addressing higher program priorities, such as the program restructure and system redesign. Without a contractor cost estimate, the system platforms program offices budgeted for interim contractor logistics support from FY 2002 through FY 2006 using different estimating methodologies. The amounts and methodology are shown in Table 1.

Table 1. Interim Contractor Logistics Support Cost and Methodology

Platform	Budgeted Amount (million)	Basis for Budget
F-15	$10.2	System program office estimate
F-16	$20.0	Warranty information
F-18	$ 8.7	Navy estimate
F-22	Not funded	n/a

Officials from the F-15 system program office stated that they based their estimate on their experience with the aircraft. Officials from the F-16 system program office stated that they used information on the warranty costs as a basis for budgeting. Navy officials from the F-18 program office indicated that they estimated the cost based on the failure rate generated by the flying hour program for the aircraft. Air Force F-22 officials did not budget for contractor logistics support because they believed that the JHMCS program office would provide the funding.

All system program offices had a different perspective for the interim contractor support funding, specifically who would pay for the support costs and how to calculate them. The methods were inconsistent and did not provide a realistic estimate for interim contractor support costs. Also, the system program offices had only budgeted through FY 2006, yet estimates show that depot activation will occur in FY 2008, which leaves at least 1 year of unfunded interim contractor support costs. The Joint Program Office must obtain an estimate from Boeing for interim logistics support costs and calculate a timeline for contractor support. The Joint Program Office can then provide estimates to the

platform system program offices and a methodology to budget for the costs to provide consistent budgeting and a sound basis for funding support costs until organic depot activation is achieved.

Conclusion

Section 2464, title 10, United States Code requires DoD to establish depot maintenance capability to support core capability requirements within 4 years of initial operational capability and to retain core depot maintenance capability. DoD regulations require that program managers determine how to most cost-effectively support the system over its entire life cycle. The Joint Program Office did not fund or obtain technical data needed for organic depot activation, and did not request an estimate for interim contractor support and provide it to system platform offices. The goal must be to minimize life-cycle costs and length of interim contractor logistics support by quickly transitioning to the most cost-effective support. The JHMCS logistics elements must be given a higher level of priority if they are to be addressed. Logistics activities, such as obtaining technical data and cost estimates for interim contractor support, should have begun when the depot decision was made, but the Joint Program Office let those opportunities pass. Further delays may cause the JHMCS to not efficiently transition from an interim contractor support capability to an organic depot maintenance capability. Additionally, costs for organic depot activation may unnecessarily increase and thus, total systems cycle costs.

Management Comments on the Finding and Audit Response

Management Comments. The Air Force Program Executive Officer for Fighter and Bomber Programs nonconcurred with the finding. The Air Force Program Executive Officer stated that depot planning was initiated immediately after the core determination decision of March 1997. The core decision required the program office to investigate and make a best value assessment on a warranty versus organic support approach. To make this evaluation, the program office used the Source of Repair Assignment Process, which in February 2000, resulted in an approval for the program office to pursue and fund depot support. To change the strategy before the February 2000 approval would have resulted in wasted funds and would not have been prudent because the JHMCS was immature and still in development. The Program Executive Officer also commented that that depot activation would occur by the first quarter of FY 2007 with the receipt of FY 2004 funds.

Audit Response. We disagree with the Air Force Program Executive Officer that earlier action would have been imprudent. After the JHMCS core determination in March 1997, the Joint Program Office completed a cost-benefit analysis in November 1998. The analysis compared costs of depot maintenance by a Government depot to the costs of a contractor depot and concluded that depot maintenance at a Government facility would result in potential monetary benefits of more than $8 million over a 10-year period. However, funding to activate the core depot was not requested until June 2000, thereby missing the

FY 2002 POM. Contract options to purchase the required technical data for the core depot had expired, and there were no contractual options in place to obtain the required information. During the contract restructure negotiations in September 2000, options to purchase the required data were not exercised because of higher program priorities. Performance timeline estimates from an Air Force Depot show that because the technical data are not under contract and the funding has not yet been obtained, the JHMCS depot activation may not meet the FY 2007 deadline.

Recommendation, Management Comments, and Audit Response

A. We recommend that the Program Manager, Joint Helmet Mounted Cueing System, request funding from the Air Combat Command and the Chief of Naval Operations to activate the Joint Helmet Mounted Cueing System organic depot, obtain technical data for organic depot logistics support and an estimate of interim contractor logistics support from the contractor, and provide the costs and the methodology to budget costs to the platform system program offices.

Management Comments. The Air Force Program Executive Officer for Fighter and Bomber Programs concurred and stated that the JHMCS program manager has provided the budget request and impacts if not funded to the Services. He further stated that it was up to the respective service funding processes to allocate the required funding.

Audit Response. The Air Force comments on funding are responsive. However, we request comments on the parts of the recommendation about obtaining technical data for organic depot logistics support and an estimate of interim contractor logistics support from the contractor.

B. Budgeting for JHMCS Requirements

The Air Force F-15, F-16, and F-22 system program offices were not provided reliable cost information to budget for JHMCS requirements. This condition occurred because the Joint Program Office did not provide updated JHMCS cost estimates in time to allow the platform system program offices to recognize the impact of the production cost changes and make needed corrections in their budget submissions for the FY 2002 to FY 2007 POM. As a result, there is a $29.7 million shortfall to acquire 205 JHMCS units within the FY 2002 to FY 2007 BES.

Criteria

DoD. DoD Directive 5000.1, "The Defense Acquisition System," updated October 23, 2000, provides that the DoD Components shall develop realistic program schedules, long-range investment plans, and affordability assessments to maximize program stability and ensure the availability of funding. Further, the acquisition community shall actively participate in the various phases of the planning, programming, and budgeting system to ensure that acquisition management issues and full funding are properly addressed.

Air Force. Air Force Material Command Financial Management Handbook dated January 2000 states that the planning, programming, and budgeting system is a budgeting process that defines and identifies the procedures the Air Force uses to obtain, allocate, and spend money. It states that during even-numbered calendar years, the Air Force must define their funding requirements for a 6-year period through the POM, the BES, and the President's Budget. The Air Force must submit the POM to the Office of the Secretary of Defense in May of even-numbered calendar years. The Air Force uses the BES to provide detailed descriptions and accurate pricing of approved programs contained in the POM. The Air Force must submit the BES to the Office of the Secretary of Defense by September of even-numbered calendar years. Information contained in the BES forms the baseline for the DoD Budget, which is included in the President's Budget that is submitted to Congress in February of odd-numbered calendar years.

Budgeting by Platform System Program Offices

Program Objective Memorandums. In May 2000, the Air Force submitted its FY 2002 POM, which covered the 6-year period from FY 2002 through FY 2007, to the Office of the Secretary of Defense. The POM included $281 million for the JHMCS and other costs associated with acquiring the system. To compute this amount the platform system program offices used an estimate supplied to them by the JHMCS Joint Program Office in October 1999, based on data provided by Boeing in December 1998. The estimate identified different unit costs for each year from FY 2002 through FY 2007. For example, for FY 2002, the unit cost was $105,574 and, for FY 2007, the unit

cost was $99,291. The reduction in unit cost was due to the effects of a learning curve on production quantity. We computed a 6-year average unit cost of $100,321 for the period from FY 2002 through FY 2007.

JHMCS requirements for the F-15 were not fully funded in the POM. The Air Combat Command, which is the Air Force requirements determination organization, identified a requirement of 273 JHMCS units from FY 2002 through FY 2007; however, sufficient funds were available for only 232 units, a difference of 41 units. We computed a funding shortfall for the JHMCS of $4.1 million, using the average unit cost of $100,321 multiplied by 41 units. Shortfalls occur when warfighter needs are greater than available funding.

Budget Estimate Submissions. The Air Force amended its POM through the submission of the FY 2002 BES in September 2000. The BES included $330 million for the JHMCS, which was a $49-million increase from the POM estimate of $281 million. The increase was due to a revised Joint Program Office average unit cost estimate for the JHMCS obtained in August 2000 and was based on data Boeing supplied in July 2000. The updated estimate included different unit costs for each year from FY 2002 through FY 2007. For example, the unit cost was $199,725 for FY 2002 and the unit cost was $132,429 for FY 2007. We computed a 6-year average unit cost of $145,215 for the period FY 2002 through FY 2007. The revised estimate increased the average unit cost by 45 percent, from $100,321 to $145,215 in less than 1 year. The cost increases resulted from design changes and new requirements to buy additional support and pilot equipment.

The F-16 system program office was unable to update the BES to reflect the cost growth in the JHMCS because it had completed and submitted its input to the FY 2002 BES by August 2000 when the revised cost estimate was issued. They used the October 1999 estimate from the JPO as a basis for their input to the BES. The F-16 JHMCS were fully funded in the BES. However, officials from the F-16 system program office stated that if they had updated the BES using the August 2000 estimate, they could have budgeted for only 572 of the 648 JHMCS requirements for FY 2002 through FY 2007, a difference of 76 units.

The F-15 and F-22 system program offices were able to recognize the updated estimate in their input to the BES that resulted in a funding shortfall of $18.7 million. The requirements defined and the quantities funded by the Air Combat Command in the BES for FY 2002 through FY 2007 are shown in the following table.

Table 2. JHMCS Unfunded Requirements for the F-15, F-22, and the F-16

Item	F-15	F-22	F-16
JHMCS requirements FY 2002-FY 2007	238	202	648
JHMCS requirements funded FY 2002-FY 2007	204	107	572
JHMCS unfunded requirements	**34**	**95**	**76**

We calculated a funding shortfall of $4.9 million by using the average unit cost of $145,215 multiplied by 34 units for the F-15; $13.8 million using the average unit cost of $145,215 multiplied by 95 units for the F-22; and $11 million using the average unit cost of $145,215 multiplied by 76 unfunded units. The total funding shortfall was $29.7 million.

The unfunded production requirements occurred because Joint Program Office officials did not update the JHMCS October 1999 estimate before the POM process began, and did not provide an updated estimate to the platform system program offices in sufficient time for their use in the budgeting process. Only after the Joint Program Office requested and obtained information from Boeing in July 2000 were estimates provided to the platform program offices for budgeting purposes. An updated estimate, based on the affordability assessment prepared shortly after the restructure in December 1999, could have recognized the financial impact of the restructure and allowed platform program offices and the Program Executive Officer enough time to obtain funding needed for the FY 2002 POM, the BES, and the President's Budget. An updated estimate would have ensured that funding shortfalls were adequately addressed in the budgeting cycle. Officials informed us that, although the Air Force system program offices were experiencing shortfalls in their budget for the JHMCS production requirements, they are working with the Air Combat Command to resolve the shortfalls in the next budget cycle.

Conclusion

DoD Directive 5000.1 provides that DoD Components develop realistic program schedules, long-range investment plans, and affordability assessments to maximize program stability and to ensure availability of funding. The Joint Program Office, as part of the acquisition community, must actively participate in the planning, programming, and budgeting system to ensure that acquisition management issues and funding are properly addressed. Because the system program offices prepared their FY 2002 POM in May 2000, based on outdated average production cost estimates and without considering the effects of the restructure, JHMCS program stability is at risk. Increased costs of 45 percent in less than 1 year due to design changes and new requirements to buy additional support and pilot equipment resulted in unfunded requirements of $29.7 million for the F-15, F-16, and F-22 system program offices in their current budget for the JHMCS Program.

If system program offices are to sufficiently budget for their JHMCS requirements, the Joint Program Office must now, in a timely manner, conduct an affordability assessment to maximize program stability and provide the system program offices with current estimates in time for the planning, programming, and budgeting system cycle. An affordability assessment will also allow the Program Executive Officer to consider the impact of changes in the unit price and make needed adjustments.

Management Comments on the Finding and Audit Response

Management Comments. The Air Force Program Executive Officer for Fighter and Bomber Programs nonconcurred with the finding and stated that early JHMCS cost models were intended only for design considerations to lower life-cycle costs. He further stated that the budgeting models require a higher fidelity for system maturity, annual procurement quantities, and aircraft integration costs. In addition, he stated that that current cost models had been updated to consider low rate initial production 1 actual costs and will be further updated using economic order quantities and learning curves from the low rate initial production 2 data. Before those models were available, the platform program offices used prior experience with similar avionics programs. He also stated that the Services had not fully funded the JHMCS due to other priorities. However, he stated that there would be opportunities in the budgets for FYs 2003 and 2004 to adjust quantities based on actual contractor costs and current Service priorities.

Audit Response. We disagree that the unfunded JHMCS requirements resulted solely from other Service priorities. The Joint Program Office provided the platform system program offices with revised unit cost estimates after the POM submission deadline. Therefore, platform system program offices missed opportunities to correct their POM budget submissions for FYs 2002 through 2007 to recognize the effect of production cost changes.

Recommendation, Management Comments, and Audit Response

B. We recommend that the Program Manager, Joint Helmet Mounted Cueing System, obtain and provide the F-15, F-16, and F-22 system program offices with the current unit cost information to budget for requirements in the Program Objective Memorandum.

Management Comments. The Air Force Program Executive Officer for Fighter and Bomber Programs concurred and is updating the Cost as An Independent Variable Model from a design tool to a cost tool. The first low-rate initial production actual costs were used in the model and have been accurate to predict costs for the second low-rate initial production. Future upgrades to the Cost as An Independent Variable Model will address the impact of economic order quantities.

Audit Response. The Air Force comments were responsive about updating cost information. However, we request additional comments about when the updated cost information will be provided to the system program offices to budget for requirements.

Appendix A. Audit Process

Scope and Methodology

The overall audit objective was to evaluate the acquisition of the JHMCS. Specifically, the audit determined whether the Air Force is cost-effectively readying the system for the production phase of the acquisition process. The audit was performed in accordance with the Inspector General, DoD, critical program management element approach, and we reviewed program management elements pertaining to core depot activation and budgeting for Joint Helmet Mounted Cueing System requirement. We reviewed program data from December 1996 through February 2001.

We performed this economy and efficiency audit from June 2000 through February 2001 according to standards implemented by the Comptroller General for the United States, as implemented by the Inspector General, DoD. We used criteria in the DoD Regulation 5000.2R to perform the audit. To accomplish the audit objectives, we determined that the JHMCS Joint Program Office had an Integrated Logistics Support Plan and that the system program offices had planning and budgeting documentation.

Use of Computer-Processed Data. We did not use computer-processed data to perform this audit.

Contacts During the Audit. We visited or contacted individuals and organizations within the Departments of the Air Force and the Navy. We also visited or contacted individuals and organizations within DoD and contractor and subcontractor officials.

DoD-Wide Corporate Level Government Performance and Results Act Coverage. In response to the Government Performance and Results Act, the Secretary of Defense annually establishes DoD-wide corporate level goals, subordinate performance goals, and performance measures. This report pertains to achievement of the following goal and subordinate performance goal.

> **FY 2001 DoD Corporate Level Goal 2:** Prepare now for an uncertain future by pursuing a focused modernization effort that maintains U.S. qualitative superiority in key warfighting capabilities. Transform the force by exploiting the Revolution in Military Affairs, and reengineer the Department to achieve a 21st century infrastructure. **(01-DoD-02).**
>
> **FY 2001 Subordinate Performance Goal 2.4:** Meet combat forces' needs smarter and faster, and products and services that work better and cost less, by improving the efficiency of DoD acquisition processes. **(01-DoD-2.4)**

General Accounting Office High-Risk Area. The General Accounting Office had identified several high-risk areas in the DoD. This report provides coverage of the Defense Weapon System Acquisition high-risk area.

Prior Coverage

During the last 5 years, the Inspector General, DoD, issued one audit report that discussed the acquisition of the Joint Helmet Mounted Cueing System. Unrestricted Inspector General, DoD, reports can be accessed at https://www.dodig.osd.mil/audit/reports.

Inspector General, DoD, Report No. D2000AB-103, "Acquisition of the Joint Helmet Mounted Cueing System," April 18, 2001

Appendix B. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition and Technology
Under Secretary of Defense (Comptroller)
    Deputy Chief Financial Officer
    Deputy Comptroller (Program/Budget)
Deputy Under Secretary of Defense for Logistics

Department of the Navy

Naval Inspector General
Auditor General, Department of the Navy

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force
Air Force Program Executive Officer, Fighters and Bombers

Non-Defense Federal Organization

Office of Management and Budget

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Efficiency, Financial Management, and Intergovernmental Relations, Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform
House Subcommittee on Technology and Procurement Policy, Committee on Government Reform

Department of the Air Force Comments

DEPARTMENT OF THE AIR FORCE
AIR FORCE PROGRAM EXECUTIVE OFFICE
WASHINGTON, DC 20330-1060

24 APR 2001

MEMORANDUM FOR: ASSISTANT INSPECTOR GENERAL FOR AUDITING
OFFICE OF THE INSPECTOR GENERAL
DEPARTMENT OF DEFENSE

FROM: AFPEO/FB
1060 Air Force Pentagon
Washington DC 20330-1060

SUBJECT: Audit Report on the Funding and Logistics for the Joint Helmet Mounted Cueing System (Project No. D2000AB-0220.001), dated February 27, 2001

This is in reply to your memorandum requesting the Assistant Secretary of the Air Force (Financial Management and Comptroller) provide Air Force comments on the subject report. Specifically, you requested the Program Manager, Joint Helmet Mounted Cueing System Program to comment on this report. The comments in this document have been developed by the JHMCS Joint Program Office (JPO), and coordinated with Air Combat Command, HQ USAF, PEO (T), and NAVAIR staffs.

This report was the second of two audit reports addressing the JHMCS. The first report, dated December 8, 2000, addressed the utility of planned operational testing and the adequacy of acquisition planning. For the period covering both reports Air Force, Navy, and Contractor JHMCS personnel spent more than 500 man-hours discussing JHMCS program details and providing JHMCS program documentation to the DoD IG Team. The subject report contradicts information provided to the IG both verbally and via program documentation concerning several of the report findings and recommendations. Specific examples of such contradictions are included in the attachment.

My point of contact for this project is Maj Aaron Clark, 703-588-7314 or aaron.clark@pentagon.af.mil.

Michael Mushala

MICHAEL C. MUSHALA, Maj Gen, USAF
Air Force Program Executive Officer
for Fighter and Bomber Programs

Atch: Detailed comments to Audit Report on Funding and Logistics for the Joint Helmet Mounted Cueing System (Project No. D2000AB-0220.001), dated February 27, 2001

Detailed Comments to Audit Report on the Funding and Logistics for the Joint Helmet Mounted Cueing System (Project No. D2000AB-0220.001), Dated February 27, 2001

DoD IG Finding A, Depot Activation of Core Capability:

> **"The activation of a depot maintenance capability to support core capability requirements for the JHMCS is delayed and at risk. This condition occurred because the Joint Program Office did not secure funding and technical data for depot capability necessary to support core capability requirements, and did not obtain and provide cost estimates to the platform system program offices to budget for interim contractor support. As a result, the JHMCS may not efficiently transition from an interim contractor support capability to an organic depot maintenance capability. Additionally, costs for depot activation may unnecessarily increase."**

Response: Non-Concur

Discussion: Non-Concur with the IG that activation of a depot maintenance capability to support core capability requirements for the JHMCS is delayed and at risk. Depot planning was initiated via the SORAP process immediately after the core determination was made on 24 March 1997. In accordance with the SAMP, the 24 March 1997 core determination directed the program to look at both commercial and organic alternatives and make a best-value assessment. The JPO effort to investigate both warranty and organic approaches was consistent with this direction, resulting in formal SORAP approval in February 2000. It would have been inappropriate and a waste of program funds to change the program strategy while the JHMCS system was immature and before the cost-benefit analysis and SORAP decision were accomplished.

Discussion: Non-Concur with IG that this condition occurred because the Joint Program Office did not secure funding and technical data for depot capability necessary to support core capability requirements. With receipt of FY04 funds, JHMCS depot activation will occur in the first quarter of FY07, consistent with commitments to USAF leadership. There is no technical basis to believe that with a go ahead in FY04 a depot capability can not be available starting in FY07. It took only 18 months from initial contract award to first flight. This included design qualification, establishment of an initial production capability and delivery of several units. Funding requirements have been identified to ACC and USN N78 for FY04.

Discussion: Non-Concur with IG that this condition occurred because the Joint Program Office did not obtain and provide cost estimates to the platform system program offices to budget for interim contractor support. The JPO considered warranty and organic support approaches. In accordance with acquisition reform guidance we then conducted a best value assessment. This took an extended time to complete because the JHMCS design was not yet mature. Accurate ICS estimates were not available to provide the platform SPO's. Over the past year, as refined estimates have become available, the JPO has provided our revised ICS costs estimates to the platforms in time for them to adjust their budget plans. The Platform offices are now budgeting accordingly.

DoD IG Recommendation (A):

"We recommend that the Program Manager, Joint Helmet Mounted Cueing System, obtain funds from the Air Combat Command and the Chief of Naval Operations to activate the Joint Helmet Mounted Cueing System organic depot, obtain technical data for organic depot logistics support and an estimate of interim contractor logistic support from the contractor, and provide the costs and the methodology to budget costs to the platform system program offices."

Response: Concur. However, the JHMCS Program Manager cannot simply "obtain" depot activation funding from ACC or CNO. That is not the way either service's funding processes work. The JHMCS program manager has provided the budget request and impacts if not funded, to the services. It is up the respective service funding processes to allocate the required funding. Budget input for the FY04 POM build have been provided to ACC and N78.

DOD IG Finding B, Budgeting for JHMCS Requirements:

"The Air Force F-15, F-16, and F-22 system program offices were not provided reliable cost information to budget for JHMCS requirements. This condition occurred because the Joint Program Office did not provide updated JHMCS cost estimates in time to allow the platform system program offices to recognize the impact of the production cost changes and make needed corrections in their budget submissions for the FY 2002 to FY 2007 POM. As a result, there is a $29.7 million shortfall to acquire 205 JHMCS units within the FY 2002 to FY 2007 BES."

Response: Non-Concur

Discussion: JHMCS early cost models were intended only for design considerations to lower life cycle costs. Budgeting models require higher fidelity relative to system maturity, annual procurement quantity, and aircraft integration costs. JHMCS budget models have now been developed based on LRIP 1 actuals. These models will be further updated based on LRIP 2 learning curves and economic order quantity prior to the full rate milestone decision. Prior to these models the platform system program offices budgeted based on prior experience with similar avionics programs. Independent of JHMCS estimated production costs, services have not fully funded JHMCS procurement on all platforms. Other service priorities required compromises on the number of JHMCS systems versus available funding. There are opportunities with the FY03 APOM and FY04 POM build to adjust quantities based on actual contractor costs and current service priorities.

DoD IG Recommendation (B):

"We recommend that the Program Manager, Joint Helmet Mounted Cueing System obtain and provide the F-15, F-16, and F-22 system program offices with the current unit cost information to budget for requirements in the Program Objective Memorandum."

Response: Concur. JHMCS program office is currently updating their Cost as an Independent Variable (CAIV) model from a design tool to a budgeting tool. The first iteration of this tool has already been used very effectively in providing cost updates to the aircraft platforms. The new CAIV model has been tied to LRIP 1 actuals and proved to be a very accurate predictor of the

LRIP 2 buy costs. At this time all platforms are meeting LRIP 2 plans. Future upgrades to the CAIV model will deal with economic order quantity impacts.

Additional Comments and Corrections

The following comment is provided concerning the "Executive Summary."

- The IG report states that the HOBS **capability "works with the Navy's AIM-9X missile."** This statement should be changed. Unlike some earlier service-specific versions of the Sidewinder missile, the AIM-9X is a joint USAF/USN weapon with the Navy as lead service for development. JHMCS use is not limited to the AIM-9X. JHMCS can be used with a variety of inventory weapons and any other weapon or sensor, including air-to-ground, the warfighter chooses to integrate JHMCS with.

Audit Team Members

The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report. Personnel of the Office of the Inspector, DoD, who contributed to the report, are listed below.

Mary L. Ugone
Raymond A. Spencer
Thomas S. Bartoszek
Lisa E. Novis
Thomas Hilliard
Chanda D. Lee
Sarah L. Brownell
Krista S. Gordon